## Space Weather Forecast

Issued on Tuesday, 01 February 2022 at 12:59 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Chance of G1-G2 Minor to Moderate Storms during day 2 (2nd February) from a likely CME arrival. Chance Moderate-flares (R1/R2 Radio Blackouts).**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Low solar activity with a number of Common class flares were observed. These were mainly from two regions close to the eastern limb and the large region in the northwest quadrant of the Sun. There are also two smaller, simpler and benign regions on the visible disc. No Earth-directed CMEs (coronal mass ejections) were observed in available imagery in the last 24 hours.

**Solar Wind / Geomagnetic Activity:** The solar wind started the period at elevated levels, but has since declined nearer to ambient values. The magnetic field strength was also weak and not conducive to significant storming. The important north-south component was mostly positive (northwards) during the period which translates to mainly quiet geomagnetic activity (Kp0-2).

**Energetic Particles / Solar Radiation:** The count of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** Mainly Low solar activity is expected through the period, but with a chance of isolated Moderate-class flares due to the presence of numerous fairly large sunspots, albeit these are currently fairly stable.

**Solar Wind / Geomagnetic Activity:** A CME which left the Sun on 29 January is forecast to arrive at Earth overnight on 1st February into the 2nd February. Solar winds are expected to remain steady and mainly quiet until then, with mainly Quiet geomagnetic conditions (Kp0-2), then potentially increasing to unsettled to Active (Kp3-4) with a chance of G1/G2 Minor/Moderate storm intervals (Kp5-6). The solar wind should then wane again during 3rd and 4th February.

**Energetic Particles / Solar Radiation:** The count of energetic particles (high energy protons) is forecast to remain at background levels whilst the sunspots we are presented with remain quiet and stable, with no radiation storms currently expected.

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Met Office

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 30 | 70 | 20 | 15 |
| Strong | G3 | No | 5 | 10 | 5 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | No | 30 | 30 | 30 | 30 |
| Very Active | R3 to R5 X | No | 5 | 5 | 5 | 5 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 5 | 5 | 5 | 5 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |
| * S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$) | | | | | | |

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